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AMPHIBIANS AND REPTILES RECORDED AT BATU APOI, A LOWLAND DIPTEROCARP FOREST IN BRUNEI DARUSSALAM

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ABSTRACT. - An inventory of amphibian and reptiles, made at the Batu Apoi Forest Reserve, Temburong District, Negara Brunei Darussalam, based on collections and observations made between 1992-1993, is presented. A total of 94 species of amphibians and reptiles have been recorded, including 50 species of amphibians and 44 species of reptiles. Poorly-known and probably rare species recorded at the site include the microhylid frog *Kalophrynus intermedius* and the colubrid snake *Ophisthotropis typicus*. The problems of sampling in architecturally complex sites such as rainforests are discussed, and long-term sampling programmes have been favoured.

INTRODUCTION

The richest forest in all of Southeast Asia in terms of tree species lies in north-west Borneo, in the region north of the Kapuas River in the west and north-east through Sarawak and Brunei, on to the extreme south-west of Sabah (Ashton, 1992). The herpetofauna of northern Borneo too shows high diversity values (cf. Inger, 1966; De Rooij, 1915, 1917; Stuebing, 1991), and species continue to be added to this fauna, through either the discovery of new species (e.g. Dring, 1983; 1987; Inger, 1989; Inger & Frogner, 1980; Inger & Gritis, 1983; Ota & Hikida, 1991) or the revival of species from synonymy (e.g. Ross, 1990).

Most of the collecting on this large continental island has been on the Malaysian states of Sarawak and Sabah, and relatively little work has been conducted in the Indonesian part (Kalimantan) or in the Sultanate of Brunei. Brunei's eastern-most district, Temburong, is almost entirely covered with lowland rainforest. An expedition to this site was held jointly by the Universiti Brunei Darussalam and Royal Geographical Society, during which a permanent field studies centre was established. The only herpetological studies conducted in the area were the observations of Reading (1992) who collected frogs from localities around the field studies centre in April-May, 1992 and reported 28 species. His work, combined

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with my more intensive long-term sampling from mostly the West Ridge of Sungai Temburong Valley have resulted in a better knowledge of the region's amphibian fauna than that currently exists for the reptiles.

The locality, Batu Apoi (115°09'E, 4°33'N), is a lowland rainforest site which is soon to be gazetted a National Park. The landscape of southern Temburong District is rugged, rising from about 50 m above mean sea level at the north of the Reserve, to the highest point, Gunung Pagon (altitude ca. 3000 m) in the south. The predominant vegetation type is dipterocarp forest, and Batu Apoi represents one of the finest examples of lowland dipterocarp formation, a forest type specially vulnerable due to their proximity of logging roads and human habitation. Around the summit ridge of Bukit Belalong (altitude 913 m), montane forests are represented.

The annual rainfall is estimated to be 2500-4000 mm, and individual rain events range from 0.1-181.5 mm. Most showers take place from the late afternoon to the early evenings. Rainfall is spread throughout the year, with distinct wetter spells noticeable between October and December, and April to August. Studies on the biological diversity of the site has been reviewed by Das (1994) and the Earl of Cranbrook & Edwards (1994).

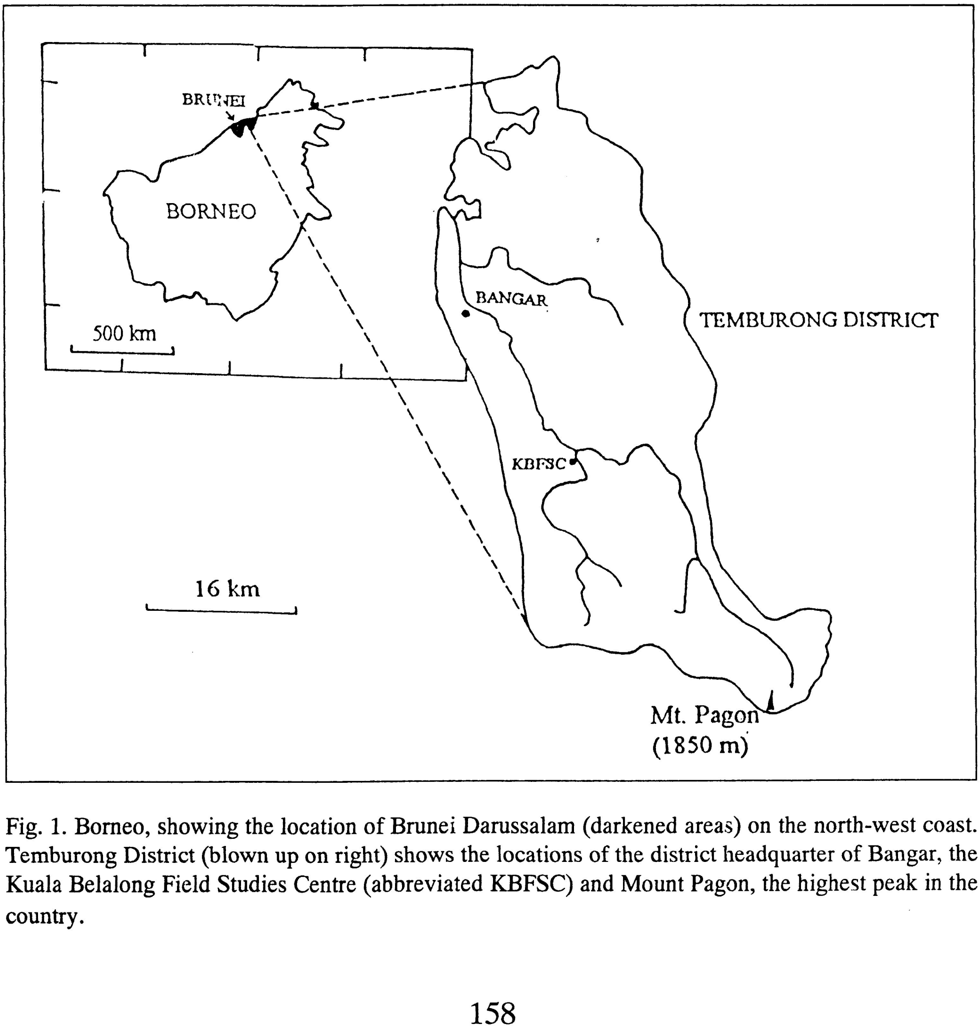

Fig. 1. Borneo, showing the location of Brunei Darussalam (darkened areas) on the north-west coast. Temburong District (blown up on right) shows the locations of the district headquarter of Bangar, the Kuala Belalong Field Studies Centre (abbreviated KBFSC) and Mount Pagon, the highest peak in the country.

METHODS

In January, 1991, a ca. six hectare area on the West Ridge of the Belalong Valley, in the vicinity of the Kuala Belalong Field Studies Centre, was selected for intensive field work, which included both riparian and non-riparian habitats and cover an altitudinal range from ca. 60-80 m (the riparian zones, where the rivers Sg. Belalong and Sg. Temburong are >10 m in width) to 80-110 m the maximum height of the non-riparian zone that was sampled, which included streams <2 m in width). Altitudinal information was obtained from a Global Positioning System (GPS). Four transects were opened, three along forest streams, one through a mixed dipterocarp forest. The effective observation area was ca. two metre off either side of the transect line and about three metre off the ground. Specimens were collected by hand along the transects, in pit-fall traps in association with drift fences, with the help of blow-pipes and rat-glue on tree-trunks. Collections were made in all months of the year in 1992 and in January and September, in 1993.

Data recorded for each individual specimen observed and/or collected include time and date of observation, vertical position, microhabitat and behaviour. A total of 446 individual animals were collected and/or observed, not including a large series of eggs and larvae that were also collected. Ecological data presented herein include basic habitat (riparian or non-riparian), vertical position and microhabitat for specimens collected during my study (specimens with registration numbers beginning with either UBD or ID). Dates of collection/observation follow field numbers in parentheses.

The collection has been deposited at the Department of Biology, Universiti Brunei Darussalam, Bandar Seri Begawan, with a voucher series being deposited at the Zoological Reference Collection, National University of Singapore, Singapore. Acronyms of repositories (after Leviton *et al.*, 1985, where available) are BMNH: The Natural History Museum, London, United Kingdom; ID: Indraneil Das, Madras Crocodile Bank Trust, Madras, India; FMNH: Field Museum of Natural History, Chicago, U.S.A.; UBD: Universiti Brunei Darussalam, Bandar Seri Begawan, Brunei Darussalam; and ZRC: Zoological Reference Collection, Department of Zoology, National University of Singapore.

The following measurements were taken: snout-vent length, head width, head length (left side of head), tibia length (left tibia; for amphibians and lizards), body width (for amphibians and lizards), total body length (snout-vent length plus tail; for caecilians, lizards and snakes), tail width (for caecilians), interorbital diameter (for caecilians) and width of lateral body stripe (for caecilians). Other characteristics noted include the number of primary body folds (in caecilians), midbody scale rows, ventrals, subcaudal scale rows, anals, supralabials and infralabials (in snakes). For the only turtle taken, the following measurements were taken: straight carapace length, straight carapace width, greatest plastron length, notch-to-notch plastron length and shell height.

Measurements of specimens up to 200 mm were taken with a Mitutoyo™ Dial Vernier Caliper to the nearest 0.1 mm; those longer were measured with a tape measure to the nearest 1.0 mm. Body weight was taken for only a small sample (especially of snakes) by a Mettler™ Electronic Balance.

RESULTS

A total of 50 species of amphibians and 44 species of reptiles were collected from the site. The inventory of the Reserve's herpetofauna is however likely to be incomplete: Reading's (1992) work, combined with mine have resulted in a better knowledge of the amphibian fauna than that currently exists for the reptiles. The snake and lizard lists appended identify perhaps 70% and 90%, respectively, of the total fauna of the Reserve. Inger & Voris (1992) reported that the maximum number of amphibian species collected from a single sites on Borneo (Nanga Tekalit, in Sarawak, East Malaysia) was 57. The 50 amphibians and 44 reptiles represent 36% and 15.1%, respectively, of the total Bornean amphibian fauna. Thus the amphibian fauna of Batu Apoi must be described as relatively diverse for Borneo.

None of the species found at Batu Apoi are new records for Borneo. However, *Kalophrynus intermedius* and *Microhyla petrigena* were collected for the first time since their description by Inger (1966) and Inger & Frogner (1980), respectively. In addition, one montane species, *Rhacophorus everetti*, thus far known only from mossy forests between elevations 900 and 1375 m in the Kina Balu massif, Sabah, East Malaysia (Inger, 1966), was taken from the site at an altitude of about 90 m.

Preparing inventories of rainforest herpetofaunas can be described as labour-intensive activities, with rapid assessment methods likely to be biased towards the more abundant species. Over 45 percent of the amphibians and 77 percent of the reptiles are represented by three or less specimens (Das, 1995), although collections spanned over a year, and included both dry and wet periods. Long-term sampling is required to inventory the herpetofauna of such architecturally complex areas because of high species diversity, low individual species density, poor visibility, seasonality in activity and the cryptic (including arboreal and subterranean) life styles of the herpetofauna (Das, 1995; Raxworthy, 1988). To prepare a complete inventory of even a small area in the tropics could take a major portion of one's lifetime (Myers & Rand, 1969).

Data on material obtained from Batu Apoi, including measurements, scale counts of snakes and ecological notes have been provided in Appendix I.

AMPHIBIANS

GYMNOPHIONA

FAMILY ICHTHYOPHIIDAE

1. *Caudacaecilia nigroflavus* (Taylor, 1960)

ANURA

FAMILY PELOBATIDAE

2. *Leptobrachium montanum* Fischer, 1885
3. *Leptolalax gracilis* (Günther, 1872)
4. *Megophrys nasuta* (Schlegel, 1858)
5. *Megophrys baluensis* (Boulenger, 1899)
6. *Nesobia mjobergi* (Smith, 1925)

FAMILY BUFONIDAE

7. *Ansonia albomaculata* Inger, 1960
8. *Ansonia leptopus* (Günther, 1872)
9. *Ansonia longidigita* Inger, 1960
10. *Ansonia spinulifer* (Mocquard, 1890)
11. *Bufo asper* Gravenhorst, 1829
12. *Bufo divergens* Peters, 1871
13. *Bufo juxtasper* Inger, 1964
14. *Pedostibes hosei* (Boulenger, 1892)
15. *Pedostibes rugosus* Inger, 1958
16. *Pelophryne brevipes* (Peters, 1867)

FAMILY MICROHYLIDAE

17. *Chaperina fusca* Mocquard, 1892
18. *Kalophrynus intermedius* Inger, 1966
19. *Kalophrynus pleurostigma* Tschudi, 1838
20. *Metaphrynella sundana* (Peters, 1867)
21. *Microhyla borneensis* Parker, 1926
22. *Microhyla petrigena* Inger & Frogner, 1980

FAMILY RANIDAE

23. *Meristogenys poecilus* (Inger & Gritis, 1983)
24. *Micrixalus baluensis* (Boulenger, 1896)
25. *Occidozyga baluensis* (Boulenger, 1896)
26. *Occidozyga laevis* (Günther, 1858)
27. *Rana blythi* (Boulenger, 1920)
28. *Rana chalconota* (Schlegel, 1837)
29. *Rana erythraea* (Schlegel, 1837)
30. *Rana hosei* Boulenger, 1891
31. *Rana ibanorum* Inger, 1964
32. *Rana kuhli* Duméril & Bibron, 1841
33. *Rana palavanensis* Boulenger, 1894
34. *Rana signata* (Günther, 1872)
35. *Staurois latopalmatus* (Boulenger, 1887)
36. *Staurois natator* (Günther, 1858)
37. *Staurois tuberilinguis* Boulenger, 1918

FAMILY RHACOPHORIDAE

38. *Nyctixalus pictus* (Peters, 1871)
39. *Philautus tectus* Dring, 1987
40. *Philautus* sp. - This material cannot be assigned to described species, for lack of comparative material and absence of acoustic data which has been used by Dring (1987) for diagnosing several species of this taxonomically difficult genus.
41. *Polypedates colletti* (Boulenger, 1890)
42. *Polypedates leucomystax* (Boie, 1829)
43. *Polypedates macrotis* (Boulenger, 1894)
44. *Polypedates otilophus* (Boulenger, 1893)
45. *Rhacophorus dulitensis* Boulenger, 1892

46. *Rhacophorus everetti* Boulenger, 1894
47. *Rhacophorus harrissoni* Inger & Haile, 1959
48. *Rhacophorus kajau* Dring, 1983
49. *Rhacophorus nigropalmatus* Boulenger, 1895
50. *Rhacophorus pardalis* Günther, 1858

REPTILES

SAURIA

FAMILY GEKKONIDAE

1. *Gehyra mutilata* (Wiegman, 1835)
2. *Gonydactylus baluensis* (Mocquard, 1890)
3. *Gonydactylus consobrinus* (Peters, 1871)
4. *Gonydactylus ingeri* (Hikida, 1990)
5. *Gonydactylus pubisulcus* (Inger, 1957)
6. *Hemidactylus frenatus* Duméril & Bibron, 1836
7. *Hemiphyllodactylus typus* Bleeker, 1860
8. *Ptychozoon horsfieldii* (Gray, 1827)

FAMILY AGAMIDAE

9. *Bronchocela cristatella* (Kuhl, 1820)
10. *Draco cristatellus* Günther, 1872 - Musters (1983) considered *Draco cristatellus* a junior synonym of *D. fimbriatus fimbriatus* Kuhl, 1820. I here follow the classification of Inger (1983), who considered *D. cristatellus* to be a valid species.
11. *Draco melanopogon* Boulenger, 1887
12. *Draco quinquefasciatus* Hardwicke & Gray, 1827
13. *Gonocephalus borneensis* (Schlegel, 1848)

FAMILY SCINCIDAE

14. *Apterygodon vittatum* Edeling, 1864
15. *Mabuya rudis* Boulenger, 1887
16. *Sphenomorphus cyanolaemus* Inger & Hosmer, 1965
17. *Tropidophorus beccarii* (Peters, 1871)
18. *Tropidophorus brookei* (Gray, 1845)

FAMILY VARANIDAE

19. *Varanus salvator* (Laurenti, 1768)

SERPENTES

FAMILY BOIDAE

20. *Python reticulata* (Schneider, 1801)

FAMILY COLUBRIDAE

21. *Ahaetulla fasciolatus* (Fischer, 1885)
22. *Ahaetulla prasinus* (Boie, 1827)
23. *Amphiesma flavifrons* (Mocquard, 1887)
24. *Aplopeltura boa* (Boie, 1828)
25. *Boiga drapiezii* (Boie, 1827)
26. *Chrysopelea pelias* (Linnaeus, 1758)
27. *Dendrelaphis caudolineatus* (Gray, 1834)
28. *Enhydris punctata* (Gray, 1849)
29. *Hydrablabes periops* (Günther, 1872)
30. *Liopeltis baliodeirus* (Boie, 1827)
31. *Liopeltis tricolor* (Schlegel, 1837)
32. *Lycodon subcinctus* (Boie, 1827)
33. *Oligodon annulifer* (Boulenger, 1893)
34. *Opisthotropis typicus* (Mocquard, 1890)
35. *Psammodynastes pictus* Günther, 1858
36. *Pseudorabdion albonuchalis* (Günther, 1896)
37. *Pseudorabdion longiceps* (Mocquard, 1892)

FAMILY ELAPIDAE

38. *Maticora bivirgata* (Boie, 1827)
39. *Maticora intestinalis* (Laurenti, 1768)

FAMILY VIPERIDAE

40. *Trimeresurus borneensis* (Peters, 1872)
41. *Tropidolaemus wagleri* (Boie, 1827)

Ashton (1963) reported on the effects of a bite sustained from a pit viper "almost certainly *Trimeresurus chaseni*" at the site. As this species is known only from localities in Sabah, north-eastern Borneo (Stuebing, 1991), the record from Brunei requires verification.

TESTUDINES

FAMILY BATAGURIDAE

42. *Heosemys spinosa* (Gray, 1831)
43. *Notochelys platynota* (Gray, 1834)

FAMILY TRIONYCHIDAE

44. *Dogania subplana* (Geoffroy Saint-Hillaire, 1809)

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APPENDIX I

DATA ON MATERIAL REFERRED TO IN TEXT

AMPHIBIANS
GYMNOPHIONA

FAMILY ICHTHYOPHIIDAE

1. *Caudacaecilia nigroflavus* (Taylor, 1960)
Material: Two examples, UBD 240 (4/12/1991), 530 (26/6/1991).
Measurements: Total body length 238.00 and 408.00 mm, snout-vent length 233.70 and 402.60 mm, head width 4.30 and 6.00 mm, head length 6.10 and 8.50 mm, body width 6.40 and 13.20 mm, primary annuli 413 and 419, lateral body stripe width 1.00 and 2.10 mm.
Ecological notes: Both examples were taken from non-riparian forest streams. One was found dead on the banks of the Upper Sitam river, below Pondok Busiri on 26/6/1991, one was taken in a pit dug for soil-erosion studies in the West Ridge trail on 4/12/1991.

2. Unidentified caecilian larva
Material: One example, UBD 130(1/3/1992).
Measurements: Total body length 142.00 mm, snout-vent length 137.60 mm, head width 4.60 mm, head length 4.60 mm, body width 4.80 mm, primary annuli 262.
Ecological notes: The only example of this caecilian was taken from the sidepool of the river Belalong, under logs in rotting leaves on 1/3/1992. Identification at present is not possible, since the larval stages of most of the described south-east Asian species are unknown.

ANURA

FAMILY PELOBATIDAE

3. *Leptobrachium montanum* Fischer, 1885
Material: Sixteen examples, UBD 153 (13/3/1992), 169 (15/3/1992), 182 (25/3/1992), 188 (25/3/1992), 200 (26/3/1992), 201 (26/3/1992), 205 (27/3/1992), 207 (27/3/1992), 250 (20/4/1992), 268 (22/4/1992), 363 (12/6/1992), 371 (29/6/1992), 442 (31/8/1992), ID 307 (7/5/1992), ZRC 1.3153 (ID Field No. 144; 12/3/1992).
Measurements: Snout-vent length 31.50-81.60 (mean 51.54 1 SE 4.39) mm, head width 13.30-36.20 (mean 21.88 1 SE 1.88) mm, head length 12.80-33.90 (mean 21.13 1 SE 1.80) mm, tibia length 11.20-31.00 (mean 20.03 1 SE 1.59) mm, body width 10.00-34.30 (mean 18.63 1 SE 1.86) mm.
Ecological notes: All 16 examples were taken from non-riparian forests. These were found on the forest floor.

4. *Leptolalax gracilis* (Günther, 1872)
Material: Ten examples, UBD 215 (8/4/1992), 236 (11/4/1992), 267 (22/4/1992), 340 (22/5/1992), 359 (11/6/1992), 379 (14/7/1992), 570 (16/12/1992), ID 305 (6/5/1992), ZRC 1.3161 (ID Field No. 288; 24/4/1992).
Measurements: Snout-vent length 22.00-46.00 (mean 34.44 1 SE 2.47) mm, head width 7.00-14.70 (mean 11.03 1 SE 0.85) mm, head length 6.60-15.10 (mean 11.02 1 SE 0.89) mm, tibia length 10.90-24.80 (mean 18.45 1 SE 1.54) mm, body width 6.40-13.80 (mean 9.55 1 SE 0.72) mm.
Ecological notes: All 10 examples were taken from non-riparian forests, from the forest floor.

5. *Megophrys nasuta* (Schlegel, 1858)
Material: Three examples, UBD 85 (19/2/1992), ID 332 (21/5/1992), CR 24.
Measurements: Snout-vent length 32.30-83.50 (mean 53.83 1 SE 15.33) mm, head width 15.50-39.50 (mean 25.43 1 SE 7.23) mm, head length 12.30-32.70 (mean 20.67 1 SE 6.17) mm, tibia length 12.30-35.00 (mean 21.90 1 SE 6.78) mm, body width 13.60-34.10 (mean 23.85 1 SE 10.25) mm.
Ecological notes: Both the specimens I collected were from non-riparian forests, from the leaf litter.

6. ***Megophrys baluensis*** **(Boulenger, 1899)**
Material: One example, UBD 470 (26/9/1992).
Measurements: Snout-vent length 41.10 mm, head width 19.80 mm, head length 14.10 mm, tibia length 20.20 mm, body width 17.20 mm.
Ecological notes: The sole example of this species was taken from non-riparian forest, from the leaf litter, on 16/9/1992.

7. ***Nesobia mjobergi*** **(Smith, 1925)**
Material: Fifteen examples, UBD 259 (21/4/1992), 346 (24/5/1992), 347 (24/5/1992), 411 (27/7/1992), 436 (29/8/1992), 457 (17/9/1992), 485 (3/10/1992), 574 (18/12/1992), 626 (15/1/1993), ID 345 (24/5/192), FMNH (ID Field No. 221; 9/4/1992), ZRC 1.3165 (ID Field No. 264; 21/4/1992).
Measurements: Snout-vent length 13.80-22.70 (mean 17.95 1 SE 0.59) mm, head width 4.60-7.40 (mean 5.83 1 SE 0.20) mm, head length 3.90-6.30 (mean 5.33 1 SE 0.18) mm, tibia length 5.30-15.30 (mean 9.81 1 SE 0.57) mm, body width 4.90-9.10 (mean 6.77 1 SE 0.27) mm.
Ecological notes: Detailed microhabitat notes are available for 10 frogs: all were associated with non-riparian areas, and were found on saplings in edges of streams. These were taken at heights between 5.00-82.00 (mean 33.35 1 SE 8.20) cm from the substrate.

FAMILY BUFONIDAE

8. ***Ansonia albomaculata*** **Inger, 1960**
Material: Fifteen examples, UBD 309 (7/5/1992), 337 (22/5/1992), 389 (17/7/1992), 396 (18/7/1992), 412 (27/7/1992), 472 (29/9/1992), 476 (2/10/1992), 481 (2/10/1992), 487 (3/10/1992), 508 (13/10/1992), 539 (31/10/1992), 617 (15/1/1993), ID 266 (22/4/1992), 318 (8/5/1992), FMNH (ID Field No. 331; 21/5/1992).
Measurements: Snout-vent length 15.50-26.60 (mean 21.21 1 SE 0.85) mm, head width 4.30-7.60 (mean 5.67 1 SE 0.23) mm, head length 3.60-5.90 (mean 4.63 1 SE 0.18) mm, tibia length 8.60-14.60 (mean 11.23 1 SE 0.40) mm, body width 5.30-10.20 (mean 7.31 1 SE 0.42) mm.
Ecological notes: All were taken from non-riparian forests, from saplings, at heights between 12.00-150.00 (mean 39.92 1 SE 13.18) cm from the substrate.

9. ***Ansonia leptopus*** **(Günther, 1872)**
Material: Ten examples, UBD 289 (24/4/1992), 382 (14/7/1992), 397 (18/7/1992), 420 (29/7/1992), 506 (13/10/1992), 510 (13/10/1992), 517 (16/10/1992), 618 (15/1/1993), 619 (15/1/1993), ID 293 (24/4/1992).
Measurements: Snout-vent length 17.40-36.90 (mean 27.23 1 SE 2.40) mm, head width 4.80-10.30 (mean 7.61 1 SE 0.66) mm, head length 4.70-8.80 (mean 6.43 1 SE 0.50) mm, tibia length 9.10-20.80 (mean 14.88 1 SE 1.36) mm, body width 4.50-11.70 (mean 8.52 1 SE 0.82) mm.
Ecological notes: All were taken from non-riparian forests, from saplings 26.00-100.00 (mean 45.60 1 SE 7.30) cm above the substrate.

10. ***Ansonia longidigita*** **Inger, 1960**
Material: Ten examples, UBD 90 (20/2/1992), 95 (21/2/1992), 96 (21/2/1992), 97 (21/2/1992), 98 (21/2/1992), 135 (11/3/1992), 160 (14/3/1992), ID 94 (21/2/1992), CR 19, 20.
Measurements: Snout-vent length 33.20-59.60 (mean 38.74 1 SE 2.39) mm, head width 9.10-15.20 (mean 10.84 1 SE 0.54) mm, head length 7.20-11.60 (mean 8.39 1 SE 0.38) mm, tibia length 17.50-30.80 (mean 4.00 1 SE 1.27) mm, body width 8.70-12.10 (mean 12.61 1 SE 1.29) mm.
Ecological notes: All were taken from the riparian forest, from the main river (Belalong), during the dry period of the year, when they were observed calling from the edge of the river.

11. ***Ansonia spinulifer*** **(Mocquard, 1890)**
Material: Five examples, UBD 146 (12/3/1992), 294 (24/4/1992), 612 (14/1/1993), 624 (15/1/1993), ID 524 (17/10/1992).
Measurements: Snout-vent length 27.90-41.70 (mean 36.00 1 SE 2.88) mm, head width 8.10-12.70 (mean 10.48 1 0.89) mm, head length 6.60-9.80 (mean 8.40 1 SE 0.64) mm, tibia length 16.40-24.10 (mean 20.72 1 SE 1.53) mm, body width 8.20-17.80 (mean 12.92 1 SE 1.62) mm.
Ecological notes: All five examples were taken from non-riparian forests. Frogs were found perched on leaves of saplings 50.0-82.0 (mean 62.0 1 SE 7.66) cm from the substrate.

12. *Bufo asper* Gravenhorst, 1829
Material: Five examples, UBD 18 (23/1/992), 19 (23/1/1992), 628 (16/1/1993), ID 16 (23/1/1992).
Measurements: Snout-vent length 33.50-111.60 (mean 70.74 1 SE 14.14) mm, head width 11.40-36.30 (mean 23.24 1 SE 4.51) mm, head length 12.50-28.10 (mean 19.24 1 SE 2.85) mm, tibia length 17.30-47.70 (mean 33.60 1 SE 5.57) mm, body width 14.00-39.70 (mean 28.30 1 SE 4.99) mm.
Ecological notes: All four examples were taken in riparian situations, within a metre of the river. Two were on logs, one on a rock and one on the walkway of the camp clearing.

13. *Bufo divergens* Peters, 1871
Material: Two examples, UBD 475 (2/10/1992), ID 383 (14/7/1992).
Measurements: Snout-vent length 36.90 and 52.70 mm, head width 12.40 and 15.10 mm, head length 8.80 and 11.60 mm, tibia length 18.80 and 24.40 mm, body width 15.80 and 18.60 mm.
Ecological notes: Both examples were collected from non-riparian forests, on leaves of saplings 5 and 20 cm from the substrate.

14. *Bufo juxtasper* Inger, 1964
Material: Eighteen examples, UBD 14 (23/1/1992), 15 (23/1/1992), 89 (20/2/1992), 136 (11/3/1992), 137 (11/3/1992), 138 (11/3/1992), 163 (15/3/1992), 176 (24/3/1992), 225 (9/4/1992), 241 (19/4/1992), 248 (20/4/1992), 254 (20/4/1992), 319 (8/5/1992), 343 (24/5/1992) (+ 1 specimens with no data), ID 224 (9/4/1992), CR 25, 27.
Measurements: Snout-vent length 22.00-108.60 (mean 46.94 1 SE 5.22) mm, head width 7.20-37.10 (mean 15.73 1 SE 1.78) mm, head length 5.70-28.50 (mean 12.36 1 SE 1.35) mm, tibia length 9.80-52.30 (mean 23.56 1 SE 2.59) mm, body width 8.00-45.20 (mean 20.45 1 SE 9.90) mm.
Ecological notes: All fifteen examples with microhabitat data were collected from riparian situations. Four toads were on or below logs, ten on rocks or pebbles and one was taken from the walkway of the camp.

15. *Pedostibes hosei* (Boulenger, 1892)
Material: Two examples, UBD 621 (15/1/1993), CR 18.
Measurements: Snout-vent length 34.70 and 74.70 mm, head width 11.60 and 24.80 mm, head length 9.30 and 18.80 mm, tibia length 17.40 and 34.10 mm, body width 12.90 and 29.00 mm.
Ecological notes: My specimen was taken from non-riparian forest, from a leaf 180 cm above a forest stream on 15/1/1993.

16. *Pedostibes rugosus* Inger, 1958
Material: One example, UBD 502 (10/10/1992).
Measurements: Snout-vent length 72.00, head width 23.90 mm, head length 17.70 mm, tibia length 33.30 mm, body width 31.30 mm.
Ecological notes: The sole example of this species was found on a boulder at the edge of the river.

17. *Pelophryne brevipes* (Peters, 1867)
Material: Seven examples, UBD 87 (20/2/1992), 220 (9/4/1992), 227 (10/4/1992), 418 (28/7/1992), 572 (17/12/1992), ID 620 (15/1/1993), CR 31.
Measurements: Snout-vent length 10.20-18.20 (mean 15.56 1 SE 1.10) mm, head width 2.20-4.40 (mean 3.83 1 SE 0.28) mm, head length 2.60-4.10 (mean 3.36 1 SE 0.24) mm, tibia length 4.80-8.60 (mean 7.36 1 SE 0.50) mm, body width 4.40-6.30 (mean 5.24 1 SE 0.29) mm.
Ecological notes: All were taken from non-riparian forests. For four frogs with detailed data, microhabitats include leaves of saplings 17.5, 70 and 88 cm above the substrate, while one was found on the leaf litter.

FAMILY MICROHYLIDAE

18. *Chaperina fusca* Mocquard, 1892
Material: Eleven examples, UBD 88 (20/2/1992), 103 (21/2/1992), 198 (26/3/1992), 269 (22/4/1992), 270 (22/4/1992), 271 (22/4/1992), 272 (22/4/1992), 273 (22/4/1992), 364 (12/6/1992), ID 304 (6/5/1992), ZRC 1.3158 (ID Field No. 233; 11/4/1992).
Measurements: Snout-vent length 17.50-21.70 (mean 19.51 1 SE 0.46) mm, head width 5.00-6.50 (mean 5.76 1 SE 0.15) mm, head length 4.10-5.70 (mean 5.02 1 SE 0.14) mm, tibia length 9.60-12.70 (mean 11.16 1 SE 0.32) mm, body width 5.30-8.60 (mean 6.89 1 SE 0.37) mm.

Ecological notes: All my frogs were found on the edges of a drum set up to collect sediments in a soil-erosion study, in a non-riparian forest.

19. ***Kalophrynus intermedius*** **Inger, 1966**
Material: Two examples, UBD 473 (30/9/1992), ID 448 (16/9/1992).
Measurements: Snout-vent length 27.50 and 31.20 mm, head width 8.30 and 8.30 mm, head length 4.90 and 6.10 mm, tibia length 12.70 and 13.60 mm, body width 13.00 and 17.20 mm.
Ecological notes: Both were taken in non-riparian forest, and were on the leaf litter, one being close to a buttress.

20. ***Kalophrynus pleurostigma*** **Tschudi, 1838**
Material: Six examples, UBD 41 (27/1/1992), 48 (28/1/1992), 197 (26/3/1992), 232 (11/4/1992), ID 361 (11/6/1992), ZRC 1.3157 (ID Field No. 104; 21/2/1992).
Measurements: Snout-vent length 10.30-50.00 (mean 35.32 1 SE 7.87) mm, head width 3.10-16.60 (mean 11.33 1 SE 2.63) mm, head length 2.00-11.60 (mean 8.17 1 SE 1.84) mm, tibia length 4.30-23.10 (mean 15.90 1 SE 3.59) mm, body width 4.30-26.70 (mean 17.48 1 SE 4.21) mm.
Ecological notes: All were found close to a drum set up to collect sediments in a soil-erosion study, in the same general area of a non-riparian forest, where adults of *Chaperina fusca* were taken.

21. ***Metaphrynella sundana*** **(Peters, 1867)**
Material: Two examples, UBD 71 (30/1/1992), ID 320 (9/5/1992).
Measurements: Snout-vent length 21.70 and 25.80 mm, head width 7.10 and 7.90 mm, head length 4.20 and 5.80 mm, tibia length 9.60 and 10.60 mm, body width 9.90 and 10.53 mm.
Ecological notes: Both were taken from trees in non-riparian forests, 0.5 and 1.0 m from the substrate. They were found in water-filled holes and located by their calls.

22. ***Microhyla borneensis*** **Parker, 1926**
Material: Seven examples, UBD 171 ("1991"), 365 (12/6/1992), 575 (18/12/1992), 614 (15/1/1993), ID 317 (8/5/1992), ZRC 1.3164 (ID Field No. 511; 14/10/1992).
Measurements: Snout-vent length 16.10-25.70 (mean 20.58 1 SE 1.79) mm, head width 4.90-9.70 (mean 6.53 1 SE 0.74) mm, head length 4.00-6.60 (mean 4.87 1 SE 0.39) mm, tibia length 10.80-16.30 (mean 13.68 1 SE 1.08) mm, body width 7.30-12.40 (mean 9.40 1 SE 1.00) mm.
Ecological notes: Of the five frogs, all from non-riparian environment, with ecological data, one was found on the leaf litter of the forest floor, and four on leaves of saplings. The vertical range of the species was 0-30 (mean 14.20 1 SE 5.89) cm above the substrate.

23. ***Microhyla petrigena*** **Inger & Frogner, 1979**
Material: One example, CR 32.
Measurements: Snout-vent length 16.80 mm, head width 4.10 mm, head length 3.70 mm, tibia length 10.70 mm, body width 7.80 mm.
Ecological notes: Microhabitat information of this specimen is unknown. Its collection from the lowland site shows that the frog, considered by Inger & Stuebing's (1992) to be a montane species (altitude >800 m), can also occur at lower elevations.

FAMILY RANIDAE

24. ***Meristogenys poecilus*** **(Inger & Gritis, 1983)**
Material: Four examples, UBD 512 (15/10/1992), ID 349 (24/5/1992), CR 11, 22.
Measurements: Snout-vent length 32.50-69.70 (mean 46.28 1 SE 8.69) mm, head width 10.30-24.10 (mean 15.65 1 SE 3.22) mm, head length 10.70-24.90 (mean 16.20 1 SE 3.26) mm, tibia length 21.90-47.30 (mean 33.20 1 SE 5.69) mm, body width 8.20-27.60 (mean 15.43 1 SE 4.31) mm.
Ecological notes: The two frogs taken by me were on leaves of saplings, 35 and 50 cm above substrate, in non-riparian situations.

25. ***Micrixalus baluensis*** **(Boulenger, 1896)**
Material: Fifteen examples, UBD 148 (12/3/1992), 185 (25/3/1992), 186 (25/3/1992), 281 (23/4/1992), 290 (24/4/1992), 291 (24/4/1992), 370 (29/6/1992), 375 (1/7/1992), 399 (18/7/1992), 405 (26/7/1992), 408 (26/7/1992), 509 (13/10/1992), 622 (15/1/1993), ID 156 (13/3/1992), ZRC 1.3152 (ID Field No. 314; 8/5/1992).

Measurements: Snout-vent length 7.90-25.80 (mean 21.97 1 SE 1.14) mm, head width 3.00-11.70 (mean 9.38 1 SE 0.52) mm, head length 2.00-9.80 (mean 8.05 1 SE 0.48) mm, tibia length 4.20-15.00 (mean 12.67 1 SE 0.67) mm, body width 3.00-12.70 (mean 9.71 1 SE 0.64) mm.
Ecological notes: Of the fifteen examples taken, all were from non-riparian zones. Six of these were from streams, seven from leaves of saplings, 10-30 (mean 17.14 1 SE 3.06) cm above substrate, one from the leaf litter close to a stream bed and one from the wet rock face of a stream.

26. *Occidozyga baluensis* (Boulenger, 1896)
Material: Fifteen examples, UBD 26 (24/1/1992), 36 (25/1/1992), 63 (30/1/1992), 74 (18/2/1992), 140 (12/3/1992), 142 (12/3/1992), 168 (15/3/1992), 279 (23/4/1992), 284 (24/4/1992), 387 (16/7/1992), 388 (16/7/1992), 615 (15/1/1993), 616 (15/1/1993), ID 279 (23/4/1992), CR 02.
Measurements: Snout-vent length 8.70-34.60 (mean 22.19 1 SE 2.52) mm, head width 3.60-11.30 (mean 7.57 1 SE 0.81) mm, head length 2.80-9.20 (mean 6.30 1 SE 0.64) mm, tibia length 4.80-17.50 (mean 12.15 1 SE 1.26) mm, body width 3.70-17.20 (mean 9.63 1 SE 1.17) mm.
Ecological notes: Of the fifteen examples taken, fourteen were from non-riparian zones, one from the riparian zone (the camp surroundings). The sole riparian example, a gravid female, was found in a water-filled bucket, where it presumably came to deposit its eggs. The non-riparian frogs were from seepages in buttresses (six examples), pebbles, leaves and roots of semi-dried streams (five), the dry leaf litter (two) and pig wallow (one).

27. *Occidozyga laevis* (Günther, 1858)
Material: One example, CR 01.
Measurements: Snout-vent length 25.70 mm, head width 8.80 mm, head length 7.60 mm, tibia length 13.30 mm, body width 9.70 mm.

28. *Rana blythi* (Boulenger, 1920)
Material: Eleven examples, UBD 17 (23/1/1992), 56 (28/1/1992), 92 (20/2/1992), 192 (26/3/1992), 416 (28/7/1992), 444 (31/8/1992), 493 (4/10/1992), 541 (31/10/1992), 606 (12/1/1993), ID 91 (20/2/1992), CR 28.
Measurements: Snout-vent length 24.50-140.30 (mean 69.09 1 SE 11.70) mm, head width 8.70-54.10 (mean 25.8 1 SE 4.54) mm, head length 8.50-49.10 (mean 22.08 1 SE 4.00) mm, tibia length 12.70-77.30 (mean 41.21 1 SE 6.80) mm, body width 8.30-40.60 (mean 21.11 1 SE 3.66) mm.
Ecological notes: Of the 10 specimens with microhabitat data, eight were taken from riparian zones, two from non-riparian ones. Of the non-riparian frogs, one was from the leaf litter, one was found sitting on a log. The rest of the specimens were from the river-edge, and were taken while either sitting on logs (two examples), on rocks or gravel (five examples) or in the camp clearing (one example).

29. *Rana chalconota* (Schlegel, 1837)
Material: Seven examples, UBD 93 (21/2/1992), 193 (26/3/1992), 607 (13/1/1993), 680 (“1993”), ID 190 (26/3/1992), ZRC 1.3159 (ID Field No. 577; 18/12/1992), CR 08.
Measurements: Snout-vent length 32.80-58.00 (mean 45.53 1 SE 3.48) mm, head width 10.40-17.30 (mean 13.61 1 SE 0.96) mm, head length 12.00-18.30 (mean 15.41 1 SE 0.85) mm, tibia length 20.20-34.90 (mean 26.56 1 SE 2.09) mm, body width 7.60-16.50 (mean 11.59 1 SE 1.28) mm.
Ecological notes: Microhabitat data are available for five specimens. All were collected from riparian forests, within 2 m or less from the river. Two were found on logs, under shrubs, two on leaves of saplings, one of which was 21 cm above substrate, and one was found sitting on the walkway of the camp.

30. *Rana erythraea* (Schlegel, 1837)
Material: None collected, but one, ID 394 (17/7/92) was seen at KBFSC.
Ecological notes: ID 394 was besides a log, ca. 0.5 m from the river.

31. *Rana hosei* Boulenger, 1891
Material: Two examples, UBD 455 (16/9/1992), CR 04.
Measurements: Snout-vent length 48.00 and 62.20 mm, head width 14.80 and 19.90 mm, head length 16.00 and 18.50 mm, tibia length 33.70 and 34.40 mm, body width 10.50 and 19.00 mm.
Ecological notes: The only example of the species collected by me was from the walkway of the camp.

32. ***Rana ibanorum*** **Inger, 1964**
Material: Two examples, UBD 376 (1/7/1992), CR 07.
Measurements: Snout-vent length 59.00 and 62.40 mm, head width 21.20 and 22.30 mm, head length 19.50 and 21.80 mm, tibia length 30.60 and 34.60 mm, body width 25.60 and 28.20 mm.
Ecological notes: My only representative of this species was from the rocky edge of the river.

33. ***Rana kuhli*** **Duméril & Bibron, 1841**
Material: Eighteen examples, UBD 25 (24/1/1992), 145 (12/3/1992), 147 (12/3/1992), 152 (13/3/1992), 155 (13/3/1992), 183 (25/3/1992), 206 (27/3/1992), 230 (10/4/1992), 280 (23/4/1992), 282 (23/4/1992), 308 (7/5/1992), 362 (11/6/1992), 385 (15/7/1992), 464 (19/9/1992), 465 (19/9/1992), CR 06, 09, 21.
Measurements: Snout-vent length 18.70-57.20 (mean 36.72 1 SE 2.18) mm, head width 7.20-23.80 (mean 14.52 1 SE 0.93) mm, head length 5.60-19.00 (mean 12.12 1 SE 0.76) mm, tibia length 9.10-30.00 (mean 19.09 1 SE 1.07) mm, body width 7.20-22.20 (mean 14.89 1 SE 1.08) mm.
Ecological notes: All fifteen examples were taken from non-riparian forests. Microhabitats include streams, where they were found underwater (nine examples), of which all save one were exposed, the solitary concealed specimen was under a fallen log, stream banks (four examples), seepage in a buttress zone (one example) and a water-filled buttress (one example).

34. ***Rana palavanensis*** **Boulenger, 1894**
Material: Sixteen examples, UBD 27 (24/1/1992), 86 (20/2/1992), 134 (25/2/1992), 139 (12/3/1992), 141 (12/3/1992), 150 (13/3/1992), 151 (13/3/1992), 217 (8/4/1992), 255 (21/4/1992), 287 (24/4/1992), 316 (8/5/1992), 449 (16/9/1992), 514 (15/10/1992), 613 (15/1/1993), ID 303 (6/5/1992), CR 03.
Measurements: Snout-vent length 9.90-32.00 (mean 23.60 1 SE 2.17) mm, head width 3.50-12.10 (mean 8.58 1 SE 0.82) mm, head length 3.60-10.90 (mean 7.83 1 SE 0.67) mm, tibia length 4.80-20.40 (mean 14.57 1 SE 1.42) mm, body width 3.10-13.30 (mean 8.98 1 SE 0.92) mm.
Ecological notes: All 15 specimens with ecological data were taken from non-riparian zones. One was from a leaf of a sapling, 14.5 cm above substrate, the rest 14 from the leaf litter. Of these, seven were associated with buttresses, and seven were far from any trees.

35. ***Rana signata*** **(Günther, 1872)**
Material: Ten examples, UBD 275 (22/4/1992), 372 (29/6/1992), 178 (24/3/1992), 194 (26/3/1992), 355 (26/5/1992), 540 (31/10/1992), 544 (31/10/1992), 545 (31/10/1992), CR 05/1, 05/2.
Measurements: Snout-vent length 16.10-54.60 (mean 38.70 1 SE 4.57) mm, head width 4.60-17.70 (mean 12.52 1 SE 1.51) mm, head length 3.90-18.00 (mean 12.89 1 SE 1.58) mm, tibia length 9.10-29.20 (mean 21.83 1 SE 2.46) mm, body width 6.00-16.90 (mean 11.71 1 SE 1.21) mm.
Ecological notes: Microhabitat data are available for eight specimens, all of which were found in the riparian areas. These include leaves of saplings, 4.5, 10 and 37 cm above water (once over a rock pool, twice over the river), on the grass in the camp clearing (one example), on rocks at the edge of the river (two examples), fallen trees, once on the dry river bed and once 30 cm above substrate.

36. ***Staurois latopalmatus*** **(Boulenger, 1887)**
Material: Four examples, UBD 605 (12/1/1993), ID 09 (22/1/1992), CR 12/1, 12/2.
Measurements: Snout-vent length 22.70-47.50 (mean 36.75 1 SE 5.17) mm, head width 6.70-14.00 (mean 11.23 1 SE 1.64) mm, head length 7.10-12.60 (mean 9.75 1 SE 1.16) mm, tibia length 15.30-31.30 (mean 25.05 1 SE 3.51) mm, body width 6.30-14.20 (mean 10.55 1 SE 1.62) mm.
Ecological notes: The two specimens in my collection with ecological data were taken from non-riparian situations, one from the wet face of a waterfall, the other from a leaf of a sapling, 1 cm above a boulder and 1.2 m from a stream.

37. ***Staurois natator*** **(Günther, 1858)**
Material: Sixteen examples, 258 (21/4/1992), 263 (21/4/1992), 274 (22/4/1992), 348 (24/5/1992), 458 (1/9/1992, 462 (19/9/1992), 463 (19/9/1992), 479 (2/10/1992), 571 (16/12/1992), 623 (15/1/1993), 625 (15/1/1993), CR 13/1, 13/2, 13/3, 13/4, ZRC 1.3163 (ID Field No.28; 25/1/1992).
Measurements: Snout-vent length 14.60-48.30 (mean 28.50 1 SE 2.27) mm, head width 4.10-12.90 (mean 7.92 1 SE 0.58) mm, head length 4.50-13.90 (mean 8.98 1 SE 0.67) mm, tibia length 8.50-30.20 (mean 18.69 1 SE 1.55) mm, body width 3.70-15.20 (mean 7.14 1 SE 0.68) mm.
Ecological notes: The 12 specimens with ecological data were taken from non-riparian zones. One was from a shallow pool, in a semi-dried stream bed, two from tree buttresses, one of which was at the edge of a stream, the other 50 cm away. Nine were from leaves of saplings, 16-200 (mean 117.33

1 SE 18.61) cm above substrate. Ten examples were taken from the vicinity of streams, 0-7000 (mean 733.50 1 SE 696.70) cm from streams. Two were taken from sites >100 m from waterbodies.

38. ***Staurois tuberilinguis*** **Boulenger, 1918**
Material: Five examples, UBD 261 (21/4/1992), ID 257 (21/4/1992), CR 14/1, 14/2, 14/3.
Measurements: Snout-vent length 27.30-29.90 (mean 28.46 1 SE 0.50) mm, head width 7.00-8.40 (mean 7.88 1 SE 0.26) mm, head length 7.80-8.50 (mean 8.20 1 SE 0.13) mm, tibia length 14.60-16.30 (mean 15.52 1 SE 0.28) mm, body width 6.60-9.80 (mean 8.44 1 SE 0.54) mm.
Ecological notes: The two examples of this species that I collected were from non-riparian situations. Both were on leaves of saplings, one, 75 cm above substrate and 2 m from a stream, the other 1 m directly above a stream.

FAMILY RHACOPHORIDAE

39. ***Nyctixalus pictus*** **(Peters, 1871)**
Material: Six examples, UBD 339 (22/5/1992), 344 (24/5/1992), 415 (27/7/1992), 478 (2/10/1992), 611 (14/1/1993), ID 685 (3/9/1993).
Measurements: Snout-vent length 21.00-38.10 (mean 32.27 1 SE 2.45) mm, head width 6.30-11.80 (mean 10.15 1 SE 0.81) mm, head length 6.40-12.10 (mean 10.50 1 SE 0.86) mm, tibia length 11.20-20.70 (mean 18.03 1 SE 1.40) mm, body width 6.00-12.30 (mean 8.63 1 SE 0.95) mm.
Ecological notes: The six examples of this species were found on the ground (one) or on leaves and branches of saplings in non-riparian forests, 0.0-112.0 (mean 39.9 1 SE 20.92) cm from the substrate.

40. ***Philautus tectus*** **Dring, 1987**
Material: One example, CR 23.
Measurements: Snout-vent length 27.7 mm, head width 9.4 mm, head length 9.0 mm, tibia length 15.7 mm, body width 8.3 mm.

41. ***Philautus*** **sp.**
Material: Eight examples, UBD 253 20/4/1992), 422 (29/7/1992), 433 (28/8/1992), 451 (16/9/1992), 516 (15/10/1992), ID 407 26/7/1992), ZRC 1.3160 (ID Field No. 433; 28/8/1992), CR 331/1, 331/2.
Measurements: Snout-vent length 10.50-24.90 (mean 20.84 1 SE 1.61) mm, head width 3.80-8.30 (mean 7.06 1 SE 0.50) mm, head length 3.00-8.30 (mean 6.59 1 SE 0.59) mm, tibia length 5.60-16.10 (mean 12.63 1 SE 1.10) mm, body width 4.60-8.50 (mean 6.45 1 SE 0.47) mm.
Ecological notes: All my six specimens were taken from the non-riparian parts of the forest, from leaves of saplings 23-250 (mean 102.50 1 SE 34.65) cm above the substrate, at the edges of streams.

42. ***Polypedates colletti*** **(Boulenger, 1890)**
Material: Two examples, UBD 494 (5/10/1992), 536 (30/10/1992).
Measurements: Snout-vent length 39.60 and 43.90 mm, head width 14.10 and 15.20 mm, head length 14.00 and 15.80 mm, tibia length 24.70 and 26.90 mm, body width 13.60 and 13.80 mm.
Ecological notes: Both were taken from non-riparian forests, from branches of trees 38 and 200 cm above the substrate.

43. ***Polypedates leucomystax*** **(Boie, 1829)**
Material: Two examples, UBD 505 (11/10/1992), 689 (3/9/1993).
Measurements: Snout-vent length 47.30 and 49.20 mm, head width 14.40 and 14.80 mm, head length 14.60 and 16.70 mm, tibia length 25.40 and 26.30 mm, body width 12.70 and 12.90 mm.
Ecological notes: Both examples were taken from riparian situations, one from a forest camp, the other from the camp walkway.

44. ***Polypedates macrotis*** **(Boulenger, 1894)**
Material: One example, CR 15.
Measurements: Snout-vent length 44.00 mm, head width 14.80 mm, head length 15.10 mm, tibia length 24.90 mm, body width 14.40 mm.

45. ***Polypedates otilophus*** **(Boulenger, 1893)**
Material: One example, UBD 537 (30/10/1992).
Measurements: Snout-vent length 28.60 mm, head width 9.90 mm, head length 10.40 mm, tibia

length 14.30 mm, body width 6.70 mm.

Ecological notes: The only specimen taken was in a non-riparian situation, from the leaf of a sapling, 40 cm above the substrate.

46. *Rhacophorus dulitensis* Boulenger, 1892

Material: One example, UBD 550 (2/11/1992).

Measurements: Snout-vent length 40.30 mm, head width 11.60 mm, head length 12.70 mm, tibia length 21.10 mm, body width 9.40 mm.

Ecological notes: My only example of this species was found in a non-riparian environment, from the leaf of a sapling, 33 cm above substrate.

47. *Rhacophorus everetti* Boulenger, 1894

Material: One example, UBD 609 (13/1/1993).

Measurements: Snout-vent length 24.40 mm, head width 8.10 mm, head length 8.30 mm, tibia length 13.30 mm, body width 8.60 mm.

Ecological notes: The only example of the species was collected from a dead stump of a sapling, in a non-riparian situation, 77 cm above the substrate.

48. *Rhacophorus harrissoni* Inger & Haile, 1959

Material: Two examples, UBD 214 (8/4/1992), CR 16.

Measurements: Snout-vent length 51.80 and 58.70 mm, head width 17.50 and 21.90 mm, head length 17.10 and 21.10 mm, tibia length 26.50 and 34.40 mm, body width 19.00 and 22.00 mm.

Ecological notes: My only specimen was taken from a tree trunk in a non-riparian forest, 200 cm from the substrate.

49. *Rhacophorus kajau* Dring, 1983

Material: Eight examples, UBD 39 (26/1/1992), 216 (8/4/1992), 474 (2/10/1992), 491 (4/10/1992), 492 (4/10/1992), 569 (11/9/1992), ID 482 (2/10/1992), ZRC 1.3154 (ID Field No. 216; 8/4/1992), CR 30.

Measurements: Snout-vent length 17.70-22.60 (mean 20.31 1 SE 0.57) mm, head width 7.20-8.20 (mean 7.66 1 SE 0.13) mm, head length 6.20-7.30 (mean 6.76 1 SE 0.14) mm, tibia length 10.80-12.90 (mean 11.96 1 SE 0.24) mm, body width 5.30-9.40 (mean 6.30 1 SE 0.47) mm.

Ecological notes: Of the five specimens with data, two were from the camp, three from leaves and branches, 120-150 (mean 136.33) cm above substrate. Two were found in amplexus 139 cm above a water-logged buttress on 4/10/1992.

50. *Rhacophorus nigropalmatus* Boulenger, 1895

Material: One example, UBD 366 (12/6/1992).

Measurements: Snout-vent length 77.00 mm, head width 28.10 mm, head length 27.90 mm, tibia length 48.7 mm, body width 23.5 mm.

Ecological notes: One was taken from the stem of a sapling in a non-riparian forest, 100 cm above the substrate.

51. *Rhacophorus pardalis* Günther, 1858

Material: One example, CR 17.

Measurements: Snout-vent length 65.00 mm, head width 19.9 mm, head length 19.6 mm, tibia length 33.60 mm, body width 20.6 mm.

REPTILES

SAURIA

FAMILY GEKKONIDAE

52. *Gehyra mutilata* (Wiegman, 1835)

Material: Four examples, UBD 222 (9/4/1992), 234 (11/4/1992), 477 (2/10/1992), 636 (16/2/1993).

Measurements: Snout-vent length 52.50-57.70 (mean 54.28 1 SE 1.16) mm, head width 8.80-9.60 (mean 9.23 1 SE 0.18) mm, head length 7.60-8.90 (mean 8.35 1 SE 0.27) mm, body width 9.70-11.50 (mean 10.78 1 SE 0.41) mm.

Ecological notes: Microhabitat data are available for two specimens. One was taken from a buttress at 160 cm above substrate, the other was in a crack on the trunk of a fallen tree. Both these, as well as the two specimens without microhabitat information were taken from non-riparian situations.

53. ***Gonydactylus baluensis*** **(Mocquard, 1890)**
Material: Seven examples, UBD 61 (29/1/1992), 229 (10/4/1992), 296 (24/4/1992), 302 (5/5/1992), 392 (17/7/1992), 529 (20/10/1992), 573 (18/12/1992).
Measurements: Snout-vent length 35.80-80.90 (mean 61.41 1 SE 7.18) mm, head width 6.10-13.10 (mean 10.29 1 SE 1.09) mm, head length 7.50-15.30 (mean 11.84 1 SE 1.22) mm, body width 4.60-13.40 (mean 8.87 1 SE 1.22) mm.
Ecological notes: The seven specimens of this gecko were taken from the non-riparian forest, from leaves of saplings (three examples), tree trunk (one), buttress (one), on fallen tree (one) and from the camp clearing. The vertical range of these specimens ranged between 0.0-400.0 (mean 94.86 1 SE 52.62) cm.

54. ***Gonydactylus consobrinus*** **(Peters, 1871)**
Material: Three examples, UBD 256 (21/4/1992), 353 (25/5/1992), 437 (29/8/1992).
Measurements: Snout-vent length 61.00-111.40 (mean 92.43 1 SE 15.83) mm, head width 10.90-18.88 (mean 15.99 1 SE 2.55) mm, head length 11.50-20.30 (mean 17.27 1 SE 2.89) mm, body width 10.70-19.60 (mean 15.23 1 SE 2.57) mm.
Ecological notes: The three examples were taken from large trees in both non-riparian forests (two) and riparian ones (one), between 33.0-110.0 (mean 66.0 1 SE 19.35) cm from the substrate.

55. ***Gonydactylus ingeri*** **(Hikida, 1990)**
Material: Seven examples, UBD 82 (19/2/1992), 203 (27/3/1992), 228 (10/4/1992), 231 (10/4/1992), 338 (22/5/1992), 409 (26/7/1992), 694 (3/9/1993).
Measurements: Snout-vent length 47.70-65.90 (mean 61.30 1 SE 2.35) mm, head width 8.20-11.50 (mean 10.54 1 SE 0.42) mm, head length 8.70-12.80 (mean 11.74 1 SE 0.53) mm, body width 7.90-10.70 (mean 9.26 1 SE 0.32) mm.
Ecological notes: The seven examples of this species were taken from the riparian forests, from leaves of saplings (five examples), the stem of a sapling (one) and the base of a tree (one). The vertical range of the species ranged between 0.0-134.0 (mean 75.0 1 SE 21.81) cm.

56. ***Gonydactylus pubisulcus*** **(Inger, 1957)**
Material: Nine examples, UBD 102 (21/2/1992), 218 (8/4/1992), 249 (20/4/1992), 252 (20/4/1992), 335 (21/5/1992), 350 (24/5/1992), 351 (24/5/1992), 374 (1/7/1992), 532 (29/10/1992).
Measurements: Snout-vent length 41.10-67.80 (mean 56.73 1 SE 3.15) mm, head width 7.00-11.70 (mean 9.54 1 SE 0.50) mm, head length 7.90-13.10 (mean 11.07 1 SE 0.58) mm, body width 6.20-14.00 (mean 8.96 1 SE 0.79) mm.
Ecological notes: Specimens were taken from both riparian (one) and non-riparian (eight) situations, from leaves of saplings (seven examples), tree trunk (one example) and the camp clearing (one). The vertical range of the species was 0.0-150.0 (mean 64.00 1 SE 14.98) cm.

57. ***Hemidactylus frenatus*** **Duméril & Bibron, 1836**
Material: Two examples, UBD 456 (16/9/1992), 459 (17/9/1992).
Measurements: Snout-vent length 37.10 and 50.90 mm, head width 6.60 and 8.40 mm, head length 6.40 and 8.60 mm, body width 6.90 and 11.60 mm.
Ecological notes: Both examples were taken from the camp clearing, which is within the riparian zone, from within buildings.

58. ***Hemiphyllodactylus typus*** **Bleeker, 1860**
Material: One example, UBD 13 (22/1/1992).
Measurements: Snout-vent length 32.1 mm, head width 4.5 mm, head length 4.7 mm, body width 5.0 mm.
Ecological notes: The sole example of this species was taken from a building, in the camp clearing, which is within the riparian zone.

59. ***Ptychozoon horsfieldii*** **(Gray, 1827)**
Material: One example, UBD 321 (see below for dates of collection).
Measurements: Snout-vent length 34.0 mm, head width 7.8 mm, head length 7.0 mm, body width 6.6 mm.

Ecological notes: Two eggs were collected from the surface of the forest leaf litter on 9/5/1992. One was broken and showed a living embryo. The other, which measured 13.7 x 11.9 mm and weighed 1.05 gm, had a flat pedicel. It was removed for incubation and hatched on 4/6/1992. Further details on the specimen can be found in Das (1992).

FAMILY AGAMIDAE

60. *Bronchocela cristatella* (Kuhl, 1820)

Material: Three examples, UBD 21 (24/1/1992), 105 (22/2/1992), 373 (30/6/1992).
Measurements: Snout-vent length 88.0-94.7 (mean 91.57 1 SE 1.95) mm, head width 13.80-14.60 (mean 14.10 1 SE 0.25) mm, head length 17.90-20.50 (mean 19.13 1 SE 0.75) mm, body width 11.80-16.90 (mean 14.97 1 SE 2.77) mm.
Ecological notes: Two examples were taken from leaves of shrubs in the camp clearing, 50 and 100 cm above substrate, one was on the walkway of the camp. All were thus from the riparian zone.

61. *Draco cristatellus* Günther, 1872

Material: Two examples, UBD 311 (7/5/1992), 503 (12/10/1992).
Measurements: Snout-vent length 188.00 and 195.00 mm, head width 8.10 and 9.10 mm, head length 10.30 and 11.60 mm, body width 8.80 and 9.00 mm.
Ecological notes: Both examples were taken from riparian zones, one from a twig, 100 cm above substrate and 3 m from the river, the other from the walkway of the camp.

62. *Draco melanopogon* Boulenger, 1887

Material: Two examples, UBD 12 (22/1/1992), 57 (30/1/1992).
Measurements: Snout-vent length 76.90 and 88.60 mm, head width 8.70 and 11.00 mm, head length 9.10 and 12.60 mm, body width 9.00 and 10.10 mm.
Ecological notes: Both examples were taken from non-riparian forests. One was found active on a tree trunk, the other sleeping on hanging moss, 1.5 m above substrate.

63. *Draco quinquefasciatus* Hardwicke & Gray, 1827

Material: Three examples of adults, UBD 181 (25/3/1992), 315 (8/5/1992), 450 (16/9/1992). Aditionally, two hatchlings were obtained from eggs that were hatched in the laboratory (see below)
Measurements: Snout-vent length 55.00-91.40 (mean 67.70 1 SE 11.86) mm, head width 7.20-10.70 (mean 8.53 1 SE 1.09) mm, head length 7.40-12.10 (mean 9.20 1 SE 1.46) mm, body width 5.50-8.00 (mean 6.47 1 SE 0.78) mm.
Ecological notes: Three adults were collected, all from non-riparian situations. One was on a vine, one on leaf of a tree and one on a tree trunk. These sites were 9.55, 46 and 134 cm above the substrate. Two eggs found in the leaf litter of a buttress, measuring 17.2 x 9.6 and 16.8 x 10.2 mm, and weighing 0.42 and 0.45 gm, respectively. They hatched in the laboratory on 29/2/1992 (Das, 1992).

64. *Gonocephalus borneensis* (Schlegel, 1848)

Material: Eight examples, UBD 333 (21/5/1992), 356 (23/2/1992), 480 (2/10/1992), 507 (13/10/1992), 515 (15/10/1992), 576 (18/12/1992), 608 (13/1/1993), 686 (2/9/1993).
Measurements: Snout-vent length 105.00-232.00 (mean 152.64 1 SE 11.24) mm, head width 7.10-18.10 (mean 9.79 1 SE 1.53) mm, head length 8.00-22.10 (mean 11.35 1 SE 1.93) mm, body width 5.90-26.80 (mean 9.86 1 SE 2.57) mm.
Ecological notes: All eight examples were taken from non-riparian forests. Four examples with detailed microhabitat data were taken from branches of saplings 46.0-110.0 (mean 77.25 1 SE 13.76) cm from the substrate.

FAMILY SCINCIDAE

65. *Apterygodon vittatum* Edeling, 1864

Material: None collected, but three sightings were made.
Ecological notes: ID 549 (2/11/1992), 627 (16/1/1993) and 697 (3/9/1993) were observed in the camp clearing, in the riparian zone.

66. ***Mabuya rudis*** **Boulenger, 1887**

Material: One example, UBD 534 (30/10/1992).

Measurements: Snout-vent length 97.7 mm, head width 16.6 mm, head length 19.1 mm.

Ecological notes: The sole example of this species was collected from the camp clearing.

67. ***Sphenomorphus cyanolaemus*** **Inger & Hosmer, 1965**

Material: Seven examples, UBD 133 (8/3/1992)195 (26/3/1992), 204 (8/3/1992), 278 (23/4/1992), 295 (24/4/1992), 313 (8/5/1992), 538 (31/10/1992).

Measurements: Snout-vent length 25.00-55.00 (mean 39.79 1 SE 4.08) mm, head width 4.00-7.70 (mean 6.30 1 SE 0.76) mm, head length 5.50-9.30 (mean 7.42 1 SE 0.72) mm.

Ecological notes: Six of seven examples of this species were taken from non-riparian situations, and only one was from a riparian zone (the camp clearing, near the buttress of a logged tree). Among the non-riparian lizards, four were associated with buttresses and two were taken asleep at night from the leaves of saplings overhanging hill streams, 30 and 50 cm above water.

68. ***Tropidophorus beccarii*** **(Peters, 1871)**

Material: One example, UBD 235 (1/4/1992).

Measurements: Snout-vent length 35.4 mm, head width 5.3 mm, head length 7.8 mm, body width 5.7 mm.

Ecological notes: My only representative of this species was collected from a leaf of a sapling, 30 cm above stream, in a non-riparian situation, where it was asleep.

69. ***Tropidophorus brookei*** **(Gray, 1845)**

Material: Twelve examples, UBD 10 (22/1/1992), 191 (26/3/1992), 199 (26/3/1992), 242 (20/4/1992), 260 (21/4/1992), 262 (21/4/1992), 352 (25/5/1992), 380 (14/7/1992), 454 (16/9/1992), 523 (17/10/1992), 533 (29/10/1992), 535 (30/10/1992).

Measurements: Snout-vent length 37.60-101.00 (mean 57.78 1 SE 5.27) mm, head width 5.40-13.10 (mean 7.91 1 SE 0.72) mm, head length 8.00-16.70 (mean 10.75 1 SE 0.80) mm, body width 4.50-20.80 (mean 9.78 1 SE 1.23) mm.

Ecological notes: Eleven of my 12 specimens were collected from non-riparian zones, the only representative from the riparian region being taken from the rocky banks of the river. The non-riparian lizards were taken from leaves and stems of saplings overhanging hill streams (eight examples), clefts of rock faces of waterfalls (two examples) and a buttress (one example). The vertical range of the species was 15.0-225.0 (mean 82.88 1 SE 22.99) cm above substrate.

FAMILY VARANIDAE

70. ***Varanus salvator*** **(Laurenti, 1768)**

Material: None collected, but three were seen along the Sungai Belalong during the day.

Ecological notes: ID 20 (24/1/1992), 175 (24/3/1992) and 367 (13/6/1992) were observed in water or on the river edges, in the riparian zone.

SERPENTES

FAMILY BOIDAE

71. ***Python reticulata*** **(Schneider, 1801)**

Material: None in collection, but one, ca. 7 m long, was found dead near the KBFSC by Samhan bin Nyawa in early 1993. The head of the specimen is preserved in the Centre.

FAMILY COLUBRIDAE

72. ***Ahaetulla fasciolatus*** **(Fischer, 1885)**

Material: One example, UBD 81 (19/2/1992).

Measurements: Total body length 569.00 mm, snout-vent length 372.00 mm, tail length 197.00 mm, head width 5.9 mm, head length 13.5 mm. Weight 3.9 gm.

Pholidosis: Midbody scale rows 15, subcaudals 197, anal 1, ventrals 231, supralabials 9, infralabials 9.

Ecological notes: The only specimen of this species was collected from the walkway of the camp, in riparian-forest.

73. ***Ahaetulla prasinus*** **(Boie, 1827)**
Material: One example, UBD 421 (29/7/1992).
Measurements: Total body length 101.10 mm, snout-vent length 64.60 mm, tail length 36.50 mm, head width 8.10 mm. Weight 15.14 gm.
Pholidosis: Midbody scale rows 15, subcaudals 170, anals 2, ventrals 207, supralabials 7, infralabials 8.
Ecological notes: The sole specimen was taken from non-riparian forest, where it was found sleeping on a branch of a tree, 89 cm above a stream bed.

74. ***Amphiesma flavifrons*** **(Mocquard, 1887)**
Material: One example, UBD 395 (18/7/1992).
Measurements: Total body length 450.00 mm, snout-vent length 315.00 mm, tail length 135 mm, head width 6.50 mm. Weight 8.94 gm.
Pholidosis: Midbody scale rows 19, subcaudals 100, anal 1, ventrals 151, supralabials 8, infralabials 9.
Ecological notes: The only specimen of this snake was found on a mossy boulder, besides a stream, in non-riparian forest.

75. ***Aplopeltura boa*** **(Boie, 1828)**
Material: Two examples, UBD 501 (9/10/1992) and 684 (31/8/1993).
Measurements: Total body length 33.8 and 60.4+ (tail-tip missing) cm, snout-vent length 23.60 and 46.00 cm, head width 0.56 and 0.93 cm, head length 0.76 and 1.47 cm.
Pholidosis: Midbody scale rows 13 and 13, subcaudals 115 and 59+ (tail-tip missing), anal 1 and 1, ventrals 159 and 159, supralabials 8 and 8, infralabials 9 and 9.
Ecological notes: Both examples were taken from the railings of the camp clearings, in riparian forest.

76. ***Boiga drapiezii*** **(Boie, 1827)**
Material: UBD 488 (3/10/1992).
Measurements: Total body length 188.60 mm, snout-vent length 144.80 mm, tail length 43.80 mm, head width 13.00 mm. Weight 85.5 gm.
Pholidosis: Midbody scale rows 19, subcaudals 126, anal 1, ventrals 270, supralabials 8, infralabials 10.
Ecological notes: Taken from riparian forest, from the walkway of the camp.

77. ***Chrysopelea pelias*** **(Linnaeus, 1758)**
Material: One example, UBD 58 (29/1/1992).
Measurements: Total body length 283.00 mm, snout-vent length 216.00 mm, tail length 67.00 mm, head width 5.10 mm, head length 8.50 mm.
Pholidosis: Midbody scale rows 16, subcaudals 85, anal 1, ventrals 199, supralabials 9, infralabials 10.
Ecological notes: Taken from riparian forest, from the camp area.

78. ***Dendrelaphis caudolineatus*** **(Gray, 1834)**
Material: One example, UBD 645 (18/4/1993).
Measurements: Total body length 75.20 mm, snout-vent length 55.20 mm, tail length 20.00 mm, head width 11.20.
Pholidosis: Midbody scale rows 13, subcaudals 106, anals 2, ventrals 173, supralabials 106, infralabials 10.
Ecological notes: Taken from riparian forest, from the camp clearing.

79. ***Enhydris punctata*** **(Gray, 1849)**
Material: One example, UBD 202 (27/3/1992).
Measurements: Total body length 727.00 mm, snout-vent length 610.00 mm, tail length 117.00 mm, head width 15.20 mm.
Pholidosis: Midbody scale rows 25, subcaudals 47, anal 1, ventrals 148, supralabials 13, infralabials 13.
Ecological notes: The single example of this species was caught from the main (Belalong) river, from a depth of ca. 10 cm, about 1 m from the shore.

80. ***Hydrablabes periops*** **(Günther, 1872)**
Material: One example, UBD 483 (3/10/1992).
Measurements: Total body length 447.00, snout-vent length 348.00, tail length 99.00 mm, head width 4.90 mm, head length 7.30 mm.
Pholidosis: Midbody scale rows 17, subcaudals 80, anals 2, ventrals 202, supralabials 9, infralabials 8.
Ecological notes: The sole example of this species was collected from rocks, 6 cm away from a stream in non-riparian forest.

81. ***Liopeltis baliodeirus*** **(Boie, 1827)**
Material: One example, UBD 644 (20/4/1993).
Measurements: Total body length 350.00 mm, snout-vent length 249.00 mm, tail length 101.00 mm, head width 5.7 mm, head length 10.9 mm.
Pholidosis: Midbody scale rows 13, subcaudals 79, anals 2, ventrals 130, supralabials 7, infralabials 8.
Ecological notes: Taken from non-riparian forest, from the forest floor.

82. ***Liopeltis tricolor*** **(Schlegel, 1837)**
Material: One example, UBD 441 (30/8/1992).
Measurements: Total body length 470.00 mm, snout-vent length 294.00 mm, tail length 176.00 mm, head width 6.60 mm.
Pholidosis: Midbody scale rows 15, subcaudals 126, anals 2, ventrals 167, supralabials 8, infralabials 8.
Ecological notes: The single example was taken from riparian forest, on the walkway in the camp clearing.

83. ***Lycodon subcinctus*** **(Boie, 1827).**
Material: None collected, but one was verified from photographs taken by Dr. Joseph K. Charles from Pondok Busiri, East Ridge, Belalong in 1991. The sole specimen recorded was found in non-riparian forest at night, on the ground near a tree buttress.

84. ***Oligodon annulifer*** **(Boulenger, 1893)**
Material: One example, UBD 83 (19/2/1992).
Measurements: Total body length 342.00 mm, snout-vent length 275.00 mm, tail length 67.00 mm, head width 65.00 mm, head length 10.70 mm. Weight 7.40 gm.
Pholidosis: Midbody scale rows 16, subcaudals 16, anal 1, ventrals 162, supralabials 8, infralabials 8.
Ecological notes: The single example of this snake was collected from the leaves of a sapling at a height of 96 cm from the substrate in non-riparian forest.

85. ***Opisthotropis typicus*** **(Mocquard, 1890)**
Material: Two examples, UBD 276 (22/4/1992), BMNH, Field number ID 381(14/7/1992).
Measurements: Total body length 422.00 and 490.00 mm, snout-vent length 310.00 and 360.00 mm, tail length 112.00 and 130.00 mm, head width 61.00 and 79.00 mm.
Pholidosis: Midbody scale rows 19 and 19, subcaudals 93 and 97, anal 1 and 1, ventrals 178 and 182, supralabials 9 and 9, infralabials 10 and 10.
Ecological notes: Both examples were collected from a hill stream in non-riparian forest.

86. ***Psammodynastes pictus*** **Günther, 1858**
Material: One example, UBD 635 (13/2/1993).
Measurements: Total body length 215.00 mm, snout-vent length 177.00 mm, tail length 38.00 mm. Weight 2.60 gm.
Pholidosis: Midbody scale rows 17, subcaudals 65, anal 1, ventrals 172, supralabials 8, infralabials 7.
Ecological notes: The single example of this snake was collected on the trail in riparian forest.

87. ***Pseudorabdion albonuchalis*** **(Günther, 1896)**
Material: One example, UBD 683 (21/8/1993).
Measurements: Total body length 133.00 mm, snout-vent length 100.00 mm, tail length 33.00 mm, head width 35.00 mm.

Pholidosis: Midbody scale rows 15, subcaudals 51, anal 1, ventrals 144, supralabials 5, infralabials 9.
Ecological notes: The sole example of the species was taken from under a log in a stream, in non-riparian forest.

88. ***Pseudorabdion longiceps* (Mocquard, 1892)**
Material: One example, UBD 172 (14/2/1992).
Measurements: Total body length 70.00 mm, snout-vent length 64.80 mm, tail length 5.20 mm, head width 2.50 mm.
Pholidosis: Midbody scale rows 13, subcaudals 16, anal 1, ventrals 154, supralabials 5, infralabials 5.
Ecological notes: The single example of the species was found drowned in a drum of water set to collect sediments in a soil-erosion study, in non-riparian forest.

FAMILY ELAPIDAE

89. ***Maticora bivirgata* (Boie, 1827)**
Material: One example, UBD 431 (24/8/1992).
Measurements: Total body length 1165.00 mm, snout-vent length 1060.00 mm, tail length 105.00 mm, head width 12.30 mm.
Pholidosis: Midbody scale rows 15, subcaudals 39, anal 1, ventrals 264, supralabials 6, infralabials 6.
Ecological notes: A single specimen is represented in my collection, which was collected from the walkway of the camp, within the riparian forest. A second specimen, which is considerably smaller, was found in the following year in the same area, and is preserved in the field centre laboratory.

90. ***Maticora intestinalis* (Laurenti, 1768)**
Material: One example, UBD 639 (20/2/1993).
Measurements: None could be taken, as the specimen is damaged. It has a body width of 3.90 mm.
Ecological notes: The only example was found on the non-riparian forest floor, where it was being eaten by ants. The head and parts of the body were missing.

FAMILY VIPERIDAE

91. ***Trimeresurus borneensis* (Peters, 1872)**
Material: Four examples, UBD 489 (4/10/1992), 638 (20/2/1993), 681 (17/8/1993), 682 (18/8/1993).
Measurements: Total body length 231.00-331.00 (mean 302.50 1 SE 24.53) mm, snout-vent length 199.00-290.00 (mean 257.25 1 SE 20.09) mm, tail length 32.00-54.00 (mean 45.25 1 SE 4.72) mm, head width 11.00-14.10 (mean 12.90 1 SE 0.72) mm, head length 11.00-15.50 (mean 13.78 1 SE 0.97) mm. Weight (n = 3, UBD 682, snout-vent length 199 mm was not weighed) 8.14-15.51 (mean 12.10 1 SE 2.15) gm.
Pholidosis: Midbody scale rows 21-21 (mean 21 1 SE 0.00), subcaudals 46-60 (mean 53.50 1 SE 3.52), anal 1-1 (mean 1 1 SE 0.00), ventrals 154-160 (mean 158.25 1 SE 1.44), supralabials 9-11 (mean 10.00 1 SE 0.41), infralabials 10-14 (mean 12.00 1 SE 0.82).
Ecological notes: Although all four examples referred to above were taken in non-riparian forest, the species has also been seen in the riparian zones, such as the edges of the camp clearing. One of the four specimens was taken from the stem of a sapling, 20 cm from the substrate. All the rest were from the substrate, one from exposed soil close to a buttress, two from the leaf litter of the forest.

92. ***Tropidolaemus wagleri* (Boie, 1827)**
Material: None collected. Verified from photographs taken by Dr. Joseph K. Charles of Universiti Brunei Darussalam and by Mr. Neil Morgan, British Council environmental education consultant to Universiti Brunei Darussalam. The species has been seen on vegetation along the rivers as well as in non-riparian forests.

TESTUDINES

FAMILY BATAGURIDAE

93. ***Heosemys spinosa*** **(Gray, 1831)**
Material: One example, Field number ID 637 (19/2/1993). Released back at point of capture.
Measurements: Straight carapace length 176.7 mm, straight carapace width 144.4 mm, greatest plastron length 180.5 mm, notch-to-notch plastron length 162.8 mm, shell height 78.1 mm.
Ecological notes: An adult female of this species was collected from non-riparian forest on 19/2/1993. It was found close to the mound of the termite *Dicuspiditermes nemorosus*. In captivity, it produced a single brittle-hardshelled egg of dimensions 62.6 x 33.8 mm, weighing 43.67 gm on 6/6/1993.

94. ***Notochelys platynota*** **(Gray, 1834)**
Material: None collected. One was found in a hill stream on the East Ridge (see photograph in Earl of Cranbrook & Edwards, 1994: 286).

FAMILY TRIONYCHIDAE

95. ***Dogania subplana*** **(Geoffroy Saint-Hillaire, 1809)**
Material: None collected. A turtle belonging to this species was found in the main river and photographs can be found in the photo library of the Expedition, maintained by Universiti Brunei Darussalam.